ABSTRACT

Title: Effect of prophylactic and functional knee brace and knee sleeve on plantar pressure distribution during stance phase of gait in healthy individuals

Summary: Knee bracing is a very commonly used method by both doctors and patients. Brace producers and also most of the studies focus the effect of the brace directly on the knee joint, but do not study, how it influences other regions of human body. This work studied the influence of knee bracing on plantar pressure distribution changes and also changes of the progression of the centre of pressure (COP).
This study rewiewed the literature for the theoretical background in biomechanics and kinesiology of gait, description of structural, functional and methodological factors influencing the dynamic interaction of the foot contacting the ground and a review of knee brace questions. The experimental part concerns a study of the gait of 6 healthy subjects using a Footscan platform and the effects of three types of knee braces on the dynamic interaction of the foot contacting the ground.

Methods: We used the Footscan modular measuring system (RSscan International, Belgium) and the force platform Kistler to detect both relative and absolute values of forces and plantar pressures under particular regions of the foot using three types of knee braces. Plantar pressure distribution and COP progression were analyzed using the Footscan and Kistler software and the Microsoft Excel program. Some results were analysed statistically using ANOVA.

Results: The plantar pressure distribution shows that modifications depend on the wearing of particular knee braces. However, the results are very dependent on the particular individual and are correspond with previous clinical inspection. The results of COP progression changes indicate some increasing of the lateral amplitude of the trace with the wearing of the knee brace.

Conclusions: The results revealed large variability reflecting the individual responses of each subject observed revealing the complexity of movement patterns in human locomotion.

Keywords: Knee brace, plantar pressure distribution, COP progression, Footscan, Kistler